The Bulletin

of the

American Association of Nurse Anesthetists

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1944

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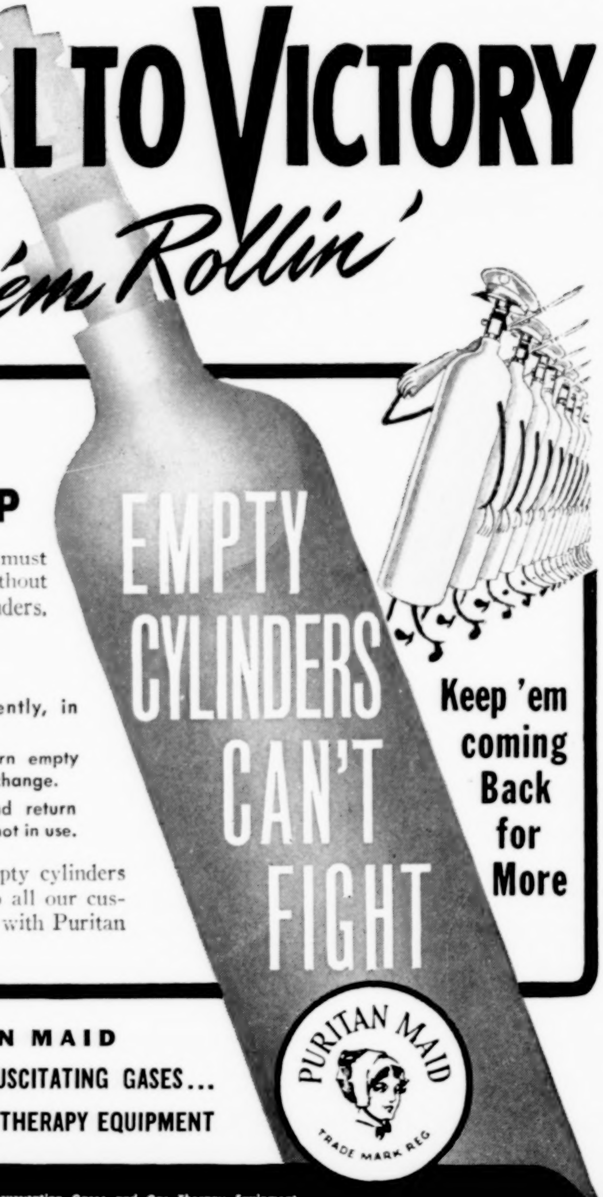

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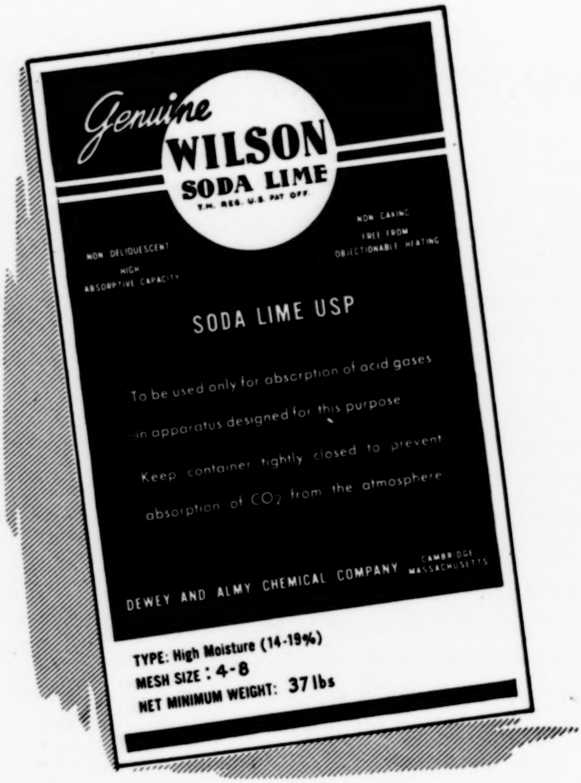
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[1] Romberger, Floyd, T.: *J. Indiana S. M. A.* 35: 613 (Nov.) 1942.

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BULLETIN OF THE AMERICAN ASSOCIATION OF NURSE ANESTHETISTS

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The Bulletin of the American Association of Nurse Anesthetists

VOLUME XII, NO. 1 FEBRUARY, 1944

THE CONTENTS

PAGE

Executive Secretary Appointed 6

"Anesthesia for Surgery of the Anus, Rectum and Sigmoid Colon"
Harry E. Bacon, M.D. 8

"Anesthesia in Obstetrics" — James M. Brockman, M.D. 13

"Refrigeration Anesthesia in Amputations of the Lower Extremities"
Conrad R. Lam, M.D. 17

"The Choice of Anesthesia in Gynecological Surgery"
John S. Silvis, M.D. 20

"Anesthesia for Crippled Children" — Zelle Slasor 24

"Metrazol (pentamethylentetrazol), N.N.R. in Anesthesia": A Review
Frederic B. Western, M.D. 26

Questions and Answers 36

Activities of State Associations 37

In Memoriam 41

Advertisers:

"Anesthesiology" 38
Dewey and Almy Chemical Company 2
Linde Air Products Company 44
Liquid Carbonic Corporation .... Inside back cover
McKesson Appliance Company 1
Merck & Company 43
Ohio Chemical & Mfg. Company .... Outside back cover
Puritan Compressed Gas Corporation .... Inside front cover
E. R. Squibb & Sons 3
Union Carbide and Carbon Corporation 44

BUY WAR BONDS

EXECUTIVE SECRETARY APPOINTED

Anne M. Campbell

Miss Anne M. Campbell has been appointed Executive Secretary of the American Association of Nurse Anesthetists. Miss Campbell comes to us from Russell Sage College, Troy, New York, where she has been Assistant Professor of Physical Education in charge of activities for college students for the last twenty years.

Miss Campbell is a native of Montclair, New Jersey, and a graduate of Montclair High School. She was graduated from New Jersey State Normal School at Montclair, now Montclair State Teachers College, and taught in the elementary schools of Atlantic City, New Jersey, and at Rutgers Elementary School, New Brunswick, New Jersey. She studied Physical Education at the Central School of Hygiene and Physical Education in New York City, and then taught Physical Education at the North Carolina College for Women in Greensboro, North Carolina. From Greensboro she went to Russell Sage College in 1924.

Miss Campbell holds a B.S. degree from Teachers College, Columbia University, and an M.A. degree from New York University. Both of these degrees were in the field of Physical Education. In 1939-40 she was granted a faculty fellowship at Russell Sage College, and spent a year working toward her doctor's degree in the field of Personnel. She holds a Dean's diploma from Teachers College, Columbia University.

Miss Campbell has spent three summers at Niels Bukh's Gymnastic People's College in Ollerup, Denmark, and has travelled in Norway, Sweden, Belgium, Holland, England, and Ireland. In 1938 she took a freighter trip, visiting Haiti and Curacao in the Dutch West Indies, and she has travelled to Cape Breton Island in Nova Scotia.

Miss Campbell was instrumental in organizing a ski school conducted under the auspices of Russell Sage College at Putney, Vermont, and she has twice attended the Tennis Camp at Hillside, Maine, conducted by Miss Marjorie Hillas and Miss Dorothy Randle, and she has spent a number of weeks several summers at Miss Constance Appleby's Hockey Camp at Mount Pocono, Pennsylvania. During her stay in England she attended the English Country Dance School at Buxton, England.

Miss Campbell is a member of the Faculty Club at Russell Sage College, and the Women's University Club of Troy, New York. She is also a member of the American Association of University Professors, the American Association for Health, Physical Education, and Recreation of the New York State Society for Health and Physical Education. She is Chairman of the Health Committee of the Troy War Council, and a member of Pi Lambda Theta, an honorary society for women in education.

The Board of Trustees feels that the Association is fortunate in securing the services of a woman of Miss Campbell's background of education and experience, and believes that unter her guidance the organization will receive an impetus which will go far toward solving the problems which face the Association at the present time. The Board bespeaks the cooperation of all the members in helping Miss Campbell to become acquainted with all phases of the work of the organization.

TWELFTH ANNUAL MEETING

The twelfth annual meeting of the American Association of Nurse Anesthetists will be held in Chicago, in September, 1944, simultaneously with the American Hospital Association meeting. The Tri-State Assembly of Nurse Anesthetists has held outstanding and unusually well-attended meetings in Chicago for several years, and we feel that we are fortunate to be able to hold our convention in that city. We believe the close contact with the energetic and progressive members of the Tri-State Assembly will serve as a real stimulus to the national organization.

Will you please send any suggestions you may have in regard to the program to Miss Edith H. Holmes, 1044 N. Francisco Avenue, Chicago 22, Illinois, Chairman of the Program Committee.

Dates and further particulars will be published in the May and August issues of the Bulletin.

NOTICES

At a meeting of the Board of Trustees held in January it was voted to purchase six $1000 United States Savings Bonds Series F, at a total cost of $4440.00.

As stated in the November, 1943, issue of the Bulletin, an election of officers was not held at the meeting in Buffalo because a quorum was not present.

Miss Miriam Shupp and Miss Lucy Richards were due to retire from the Board of Trustees at that meeting. On the ballot prepared by the Nominating Committee were to appear the names of Miss Edith H. Holmes, Chicago, and Miss Margaret F. Sullivan, New York, to fill the places on the Board. Following the meeting Miss Richards and Miss Shupp resigned, and the Board of Trustees appointed Miss Holmes and Miss Sullivan to fill the places left vacant as a result of the resignations.

Miss Shupp is still Chairman of the Certification Program Committee. Miss Richards is Chairman of the Membership Committee.

ANESTHESIA FOR SURGERY OF THE ANUS, RECTUM AND SIGMOID COLON

HARRY E. BACON, M.D., F.A.C.S., F.A.P.S.
Professor Proctology, Temple University Medical School, Philadelphia

Read before the Mid-South Post Graduate Nurse Anesthetists Assembly held in Memphis, Tennessee, February 1942.

There is probably no other single subject of such vital import to surgeons, as a group, as anesthesia. By surgical anesthesia is implied a condition of insensibility, artificially produced, without interference with vital functions, whereas analgesia connotes loss of the protopathic sense-pain. Any drug sufficiently powerful to produce unconsciousness is potentially dangerous. The same is true when it is injected intradurally, as for example, around the sympathetic nerve ganglia. Therefore, the choice of an anesthetic or analgesic and its method of administration are important factors in operations on the anus, rectum and sigmoid colon, their selection being largely dependent on the proper interpretation of the patient's physical and mental condition, as well as the dexterity of the surgeon.

In general anesthesia, a state of unconsciousness and insensibility is induced, while in regional analgesia the sensation of pain is inhibited in a part of the body by obtunding the peripheral nerve endings, the conducting pathways, or the receiving neurons of pain perception. For operative purposes one must bear in mind that analgesia per se is not real anesthesia, but rather an inhibition or paralysis of the pain-conducting fibers to a particular area; therefore, tactile sense is not usually impaired, as evidenced by the patient's interpretation of touch or temperature as such.

In this country, as well as abroad, the selection of an anesthetic is determined frequently by or based on the tradition of the hospital or surgical service, and by the training and experience of the individual surgeon or anesthetist. Individualism of each and every patient should alone determine the drug which is to be employed. The age, sex, stature, nutritional state, mental status, and weight must be considered. Blood pressure recordings made repeatedly and in both arms, and the cardiac and pulmonary conditions, as well as kidney function, should be evaluated. Complete blood count and blood chemistry may also bear influence.

In selecting an anesthetic, one that offers minimal danger and interference with vital functions, that is easily administered and introduced with minimal discomfort, that is least toxic and quickly eliminated, that does not impair the functions of the patient on withdrawal, should be chosen, provided that it meets the requirements of the operation to be performed.

In relation to anesthesia, what are the demands for surgery of the anus, rectum and sigmoid colon? In part, this depends on the pathology and its extent, the approach—whether abdominal or perineal, the operation and the time required. Muscular relaxation is an essential factor, because it permits better visualization, and allows the operation to be performed more quickly with less trauma to the anorectum, and with minimal shock. As a result, the incidence of postoperative sequelae and complications is reduced. Generally considered, all types of inhalation anesthesia, because of retching and vomiting, with resultant increased abdominal pressure and venous congestion, promote a greater degree of spasmodic contraction of the sphincter muscle, inciting postoperative pain.

Ether, preferably by the open drop method, is satisfactory in cases of radical extirpation of the rectum and sigmoid for cancer, diverticulitis and lymphogranulomatous stricture, et cetera. The degree of relaxation, however, is not so complete as with lumbar or spinal analgesia. In infancy, for conditions such as imperforate rectum, abscess and fistula, prolapse, et cetera, open drop ether or vinethene has proved ideal.

Nitrous oxide is especially useful in procedures of short duration as in the examination of neurotic patients, or those suffering from severe pain, and for divulsion of the sphincter muscle.

Ethylene offers greater muscular relaxation with a greater margin of safety than does nitrous oxide. Because of its physiochemical properties, it is so highly explosive that the cautery and electric spark are prohibited and static electricity must be eliminated.

Cyclopropane affords muscular relaxation comparable to that of ether. It, indeed, is a satisfactory anesthetic. Based on the experimental work of Robbins, Baxter and Fitzhugh[14] of Nashville, a barbiturate is given as a preanesthetic medication rather than morphine or dilaudid, when cyclopropane is employed.

Intravenous anesthesia with pentothal sodium is a worthy addition to our armamentarium. For procedures of short duration, such as the removal of a foreign body, crypt, hypertrophied papilla, or a divulsion, it is ideal. The technique is simple and it may be administered safely by those experienced in its use. From the standpoint of the patient, it appears to be a most agreeable anesthetic.

Tribromethyl alcohol or avertin may be satisfactorily employed in surgical maneuvers of the rectum. Some prefer it as a basal anesthetic. While the rectum and colon are not irritated by the drug, it is contraindicated in the presence of local ulceration, in advanced hepatic and renal disease, in marked cachexia and advanced tuberculosis.

Ethyl chloride still has its proponents, but its use is relegated to office procedures for simple incision and drainage of subcutaneous and pilonidal abscesses.

Conduction analgesia described by Braun[4], Allen[1], de Takats[5], and Werner[6] as infiltration anesthesia, constitutes a maneuver in which the conducting pathways are enveloped by the analgesic solution—the nerves being affected by diffusion. This method has been employed[2, 3] with excellent results in the surgical treatment of selected cases of internal and external hemorrhoids, prolapse, polyps, fissure, fistulae of the simple, straight variety, inflamed crypts, hypertrophied papillae, intra-anal ulcer, condylomas and skin tags. It is not applicable, however, where the extent of the disease process has not been determined before operation, when free suppuration is present, where there exist massive condylomata, multiple and complicated fistulae, or any tumor process in which extensive surgical intervention is required, and the growth is located in the region of the peritoneal reflection. These, and such conditions as sequestration dermoid cyst, stricture, procidentia recti, congenital anomalies, and imbedded foreign bodies, are better treated under general anesthesia or spinal analgesia. The chief disadvantage of conduction analgesia is the period of time consumed in its administration. It is of especial value in the extreme aged, those suffering with some cardiovascular disease and in the obese.

Caudal analgesia, also termed epidural or extradural block, is accomplished by the injection of an analgesic solution through the sacral hiatus which, by entrance into the sacral canal, bathes the terminal fibers of the spinal cord below the dural sac. It may be employed with satisfaction for most procedures on the anorectum; it is safe, and not difficult of administration. Its chief disadvantages are the uncertainty of the analgesia with respect to the time of onset and the extent; the percentage of failure being recorded as high as 25 per cent[20]. Infrequently a decrease or an increase in blood pressure is noted [19]. Reuther[21, 22] has found that injection of 18 to 23 cc. of metycaine, 2 per cent solution, affords adequate analgesia for forty-five to ninety minutes.

Sacrocaudal represents a combination of caudal and trans-sacral block. For operative procedures on the anus and rectum it is ideal. While technical and more time-consuming and difficult of administration than either caudal or spinal, it is sufficiently simple as to be mastered by those who are conscientious in its use. Analgesia occurs in approximately ten minutes and lasts one to four hours. Among its advantages to be mentioned are absence of risk, complete analgesia and reduction of postoperative pain.

Spinal analgesia, intradural block, rache-analgesia or medullary narcosis produced by injecting a local anesthetic into the subarachnoid space, effects a regional loss of sensation that is unequaled. It is generally conceded that when properly employed, spinal analgesia permits of greater safety than when a general anesthetic is used, for as has been shown, its mortality and morbidity compare favorably with other types of anesthesia[16, 17, 18]. In a series of 4500 operations on the anus, rectum and sigmoid, we have had no deaths that could be attributed to the spinal analgesia. Because of its quick administration and the excellent relaxation afforded, it is to be preferred for surgical maneuvers on the lower bowel. The analgesia is produced without loss of consciousness; the respirations are quiet and unaccompanied by coughing or straining, thereby permitting the surgeon to perform his task unhampered by extraneous movements. Nausea and vomiting are infrequent; postoperative pain and distention are lessened, and fluids are retained early. As to disadvantages, the occasional disagreeable sensation during analgesia, reduction in blood pressure, postoperative headache, and urinary retention are to be mentioned. Contraindications include shock, except that produced by previous postoperative hemorrhage, marked hypertension in adults, extreme hypotension, decompensation and decreased vital capacity, septicemia, diseases of the central nervous system, and localized abscess or ulcers at the site of the proposed injection.

For the radical extirpation of cancer of the rectum and sigmoid, for diverticulitis, lymphogranulomatous strictures, et cetera, a combination of novocain 10 per cent and pontocaine, or glucose and pontocaine injected in the second lumbar interspace is employed. The blood pressure is usually controlled by local infiltration of the abdominal skin by using procaine and adrenalin or intravenous glucose and saline solution.

Operations for pathologic processes of the rectum rarely consume more than an hour, therefore only a small dose of the analgesic solution introduced at a low level of the spinal canal is required. Because of these two factors, the fall in blood pressure is less marked than in upper abdominal procedures which necessitate the employment of large doses at a higher level.

Our investigation showed that a scale of dosage computed according to the body weight of the patient, irrespective of the age or height, would give adequate and satisfactory analgesia.

TABLE I

WEIGHT	DOSAGE	INTERSPACE
(pounds)		
70-100	40 mg.	4th L.
101-150	50 mg.	4th L.
151-170	60 mg.	4th L.
171-190	70 mg.	4th L.
191-210	80 mg.	4th L.
211-220	90 mg.	4th L.
221-240	100 mg.	4th L.

As reported in 1940[23], accurate and complete data are available on 1126 of a series of 1698 cases. The operative procedures were performed on various types of anorectal abscesses; hemorrhoids, except the external thrombotic type and skin tags; fissure in ano; simple, complex and complicated fistulae; anal incontinence, prolapse and procidentia; cryptitis; benign and malignant tumors of the anal canal and rectum; esthiomene; perianal and perineal cysts; pruritus and kraurosis ani; pilonidal cysts and sinuses; inflammatory stricture and stenosis; large foreign bodies and fractured coccyx.

In this group there were no deaths attributable to the analgesia. Of the 1126 cases, analgesia was inadequate in twenty-five, twenty-two of which required supplementary measures. Seventeen of this number were in cases of perineal excision for carcinoma or inflammatory stricture, one for levatorrhaphy, and another the excision of a presacral dermoid. All consumed more than ninety minutes operating time. In two, the 5th lumbar interspace was mistakenly selected, and in four, a portion of the analgesic solution was lost. Loss of the protopathic sense was delayed in fifteen. The last may be attributed almost entirely to inadequate dispersion of the analgesic solution with the spinal fluid.

For the three-year, two-month period ending April, 1940, 821 patients received neosynephrin hydrochloride for the purpose of sustaining blood pressure. No untoward reactions of serious import were noted, although seven patients complained of headache during operation. There was no marked degree of pulse accentuation as compared with that following ephedrine or epinephrine. The dosage was calculated in accordance with the systolic blood pressure following sedation immediately before operation[24].

TABLE II

SYSTOLIC B.P., LEFT ARM	DOSAGE OF NEOSYNEPHRIN
131-140	0.1 cc. in 1 cc. ½% procaine
121-130	0.2 cc. in 1 cc. ½% procaine
111-120	0.3 cc. in 1 cc. ½% procaine
101-110	0.4 cc. in 1 cc. ½% procaine
91-100	0.5 cc. in 1 cc. ½% procaine

The incidence of headache, which varied from a mild fullness to pain of an intractable character, was 11 per cent and can be attributed, for the most part, to the patient's being permitted out of bed the third and, in some cases, the second postoperative day. The use of a short beveled, small caliber needle, No. 22 gauge, thorough dispersion, warming the solution to body temperature, elimination of air with the injection, foot elevation with the head dependent during and after operation when a hypobaric solution is employed, control of fluids, injections of glucose or normal saline solution intravenously, administration of magnesium sulfate intramuscularly or of surgical pitutrin subcutaneously, ice bags to head, and drugs such as caffeine, amidopyrine, and acetanilid — all have failed to lessen materially the disturbance in the cerebrospinal hydrostatics. From May, 1941, to February 1st, 1942, all patients on whom lumbar analgesia was employed, were given thiamin chloride by mouth daily. Only one case of post-spinal migraine has been encountered[13]. The action of the thiamin chloride is not definitely known. However, Cadman brings out the point of diminished brain tissue respiration in which there is accumulation of lactic acid in the brain tissue. This accumulation apparently depends upon the B_1 function of oxidizing pyruvate and when oxidized can be removed, even if it accumulates.

Urinary retention is very definitely increased where lumbar analgesia is employed. Whereas our former percentage was 7.1, it has been materially reduced through the use of prostigmin following operation.

In anorectal procedures, prolonged analgesia may be obtained by injecting some of the oil or preferably aqueous anesthetics into the substance of the external sphincter muscle. For this, diothane[7, 8, 9, 10, 11, 12] is a drug par excellence. Operations in this locality enjoy an unenviable reputation for postoperative pain among physicians, nurses, and the laity, and unfortunately this reputation is not unfounded[13]. As recently reported, our incidence of postoperative pain in a series of 1682 cases was 7.6 per cent[15].

Summary and conclusions

For surgery of the anus and rectum, regional analgesia, either sacrocaudal or lumbar, has been the procedure of choice in our hands. In cases of radical extirpation, lumbar analgesia is used. For procedures of short duration, pentothal sodium is equal to the occasion.

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ANESTHESIA IN OBSTETRICS

JAMES M. BROCKMAN, M.D., F.A.C.S.

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Obstetrics presents a fertile field for the art and science of anesthesia, and the administration of anesthetic agents is both an art and a science. Anesthesia has as its purpose the relief of sensibility to pain, and analgesia has the same purpose. Unity of purpose so closely allies the two that a discussion of one warrants some discussion of the other.

Analgesia for the relief of pain during labor has ceased to be a novelty, or limited to a few, but is being used to a wider extent almost daily. The anesthetist thus frequently first comes in contact with the obstetrical case to find the patient under the influence of a variety of drugs.

Our experience in analgesia has led us to believe that the term analgesia is a misnomer. Amnesia should be the correct term. With the exception of the opiates, the use of which is considerably limited, we depend more on the patient's lack of memory of the pains of labor to evaluate the analgesia than we do upon the actual relief of pain. We thus theorize: "If pain is not remembered, there wasn't any pain." This is somewhat akin to the magician's "Now you see it, now you don't." The lack of the patient's remembrance of pain constitutes amnesia. Use of analgesic and amnesic agents in the first stage of labor limits the use of general anesthetic agents to the second stage of labor.

To those who contend that the real

pain of labor is confined to the second stage, we contend that pain is pain, real or not. Individual susceptibility to pain and variances in the pain threshold are problems that require individual treatment. It must be kept in mind that the pain of labor is generally conceded to be a different type of pain than that caused by injury or disease. The shock element is absent. To obtain even near-complete analgesia would in all probability violate one or more of the precepts which we must follow in order to give drugs during labor. Since this is not desirable and we can obtain through amnesia the goal we seek, our purpose is the same. The precepts to be followed in the use of agents to produce amnesia, analgesia and anesthesia are: first, they must not interfere with the progress of labor; second, they must not harm the child; third, they must not harm the mother. There are no drugs, chemicals or gases that will not violate one or more of these rules if improperly used.

The barbiturates have come into general use in the last few years. Synthesis of barbital has led to a large group of complex compounds with varying margins of safety and action. They are primarily hypnotics and sedatives. They are also respiratory depressants of the first magnitude, are toxic and habit-forming. Idiosyncrasy to the barbiturates may be normally present, or can be easily developed in some individuals. Mental disorientation frequently results from a single dose and their long use may result in mental deterioration. They are excellent basal drugs for certain types of anesthesia, and since their introduction have come to be a part of almost every pattern of analgesia.

Hyoscine, a cerebral depressant and amnesic of the highest excellence, is used widely in obstetrics as part of most analgesia routines. After basal analgesia and amnesia has been obtained we have found that doses as small as 1/600 to 1/300 grain have been sufficient to maintain the desired amnesic state. Hyoscine when given by the clock rather than by the patient's needs commonly results in a state of restlessness and wildness, manifested with each pain. Small doses of the opiates at this time will help materially to control this excitement. Unfortunately this state of excitation is blamed on the barbiturates when they are used in conjunction. Individual susceptibility is characteristic for hyoscine and must be taken into consideration at all times when its use is a daily routine.

The opiates are the sheet anchors on which we all depend for relief of pain. The dosage should be small and not repeated frequently, because of the depressant qualities. This depression is noted more in the baby than in the mother. A safe rule is to give no opiates if expected delivery will occur within four hours of its administration. We use morphine 1/8 to 1/6 grain, and dilaudid 1/64 grain as the primary opiate, giving at the most only two such doses during labor.

Paraldehyde has for us two clinical objections, its odor and taste. Limited contact prohibits further comment.

Various combinations of part, or all of the previously mentioned drugs are in daily use to produce amnesia in the first stage of labor. The anesthetist's familiarity with these drugs should be as great as the knowledge of the stages of anesthesia and of the general anesthetic agents.

The general anesthetic agents are usually limited to the delivery room stage of labor. Here the anesthetist contacts the patient for the first time.

This patient may have a mild to a severe cardiac condition, a varying degree of toxemia, an acute coryza or bronchitis, no preanalgesia or too much, an empty or a full stomach, some febrile or infectious disease, may be in or near a state of acidosis, and also be ready to be delivered. The choice of the anesthetic agent to be used and the degree of anesthesia should be given as much consideration as in general surgery.

Nitrous oxide was the first of the gases to be used for anesthesia. Induction is quite easy, there is very little excitement and anesthesia quickly follows. The oxygen content must necessarily be low and for this reason cyanosis is common. Anoxemia may result from inadequate oxygen. Relaxation is extremely poor. Nitrous oxide and oxygen is fairly satisfactory for analgesia, especially if a small amount of ether vapor is added.

Ethylene is very satisfactory for combined analgesia and anesthesia. The change from analgesia to anesthesia is quickly obtained with corresponding good relaxation. There are objectionable features to be kept in mind, however, such as the tendency to increased bleeding, increase in the baby's bleeding time, and the production of acidosis. An extremely objectionable feature is the tendency to cause vomiting. When the patient has a full stomach, the vomiting may result in aspiration of food particles.

Cyclopropane allows a rapid induction of anesthesia. The oxygen content is high and muscular relaxation is good, except in the uterus, which does not relax. Cyclopropane does not stimulate respiration, but acts to depress, and where the patient has received a satisfactory degree of analgesic drugs, this gas does not prove adequate. The toxic effects of cyclopropane on the heart, and the tendency to lower the blood pressure results in a possibility of shock, with or following surgical procedures.

When we plan the use of cyclopropane, we have found that the least possible premedication before the operation is best, which is contrary to our preparation of the patient for other types of anesthesia. For surgery of the pelvis we give morphine grain 1/6 and atropine grain 1/150, thirty minutes before operative time. For cesarean section, the atropine is given thirty minutes before operation, and the morphine when the patient starts to the operating room. The high oxygen factor used with cyclopropane is of definite advantage in cesarean section.

Chloroform was the first of inhalation anesthetics to be used in obstetrics and is still used by many. As an anesthetic for general use, however, chloroform anesthesia is becoming a lost art. Few schools of anesthesia teach chloroform technique and in some hospitals a special permit is almost required to obtain a bottle of chloroform. Induction is short, the stages of anesthesia pass rapidly, and relaxation is ideal. In procedures requiring complete uterine relaxation, no other anesthetic equals chloroform. The toxicity of chloroform is so great that it may well be shelved for general use.

Ether, as a straight anesthetic or in combination with the gases, still holds the top position of the inhalation anesthetics. Ether can probably be given safely for more cases, and under more unfavorable circumstances, than any of the inhalation anesthetics. Ether used for analgesia purposes, if continued over some length of time, will tend to slow down the frequency of the labor contractions, and given to the surgical anesthesia stage results in a complete cessation of labor. This offers us a fairly safe anesthetic where complete relaxation is desired. Version and extraction, and retraction ring relaxation require the complete uterine relaxation obtainable with ether.

Spinal anesthesia has been a complete failure in obstetrics in our hands.

Local infiltration with procaine hydrochloride is probably the ideal anesthetic for any and all types of operative procedures. It can be used when all other anesthetics are contraindicated. One item of importance, however, is the need of intelligent cooperation on the part of the patient. In certain cases this is impossible to obtain.

Our desire for some type of anesthesia to replace local infiltration when the patient is unable to cooperate, resulted in a trial of pentothal sodium intravenously. The following brief report of a case will illustrate the point in question.

Negro, female, age 27, gravida I, Para O.

Was admitted to our service in the John Gaston Hospital, April 19, 1940.

Chief complaint: Dizziness, headaches and blindness, duration of about four months.

Physical examination: Temperature 98, pulse 80, respiration 20, B.P. 232/140.

Mental: Apathetic.

Face: Swollen.

Eyes: Lids edematous, conjunctiva edematous and watery.

Heart and Lungs: Heart negative.
Lungs edematous.

Abdomen: Enlarged to size of full term pregnancy. F. H. T. 158, good volume. Pitting edema of entire abdomen.

Extremities: Marked pitting edema.

Laboratory:

Blood: Red blood cells—3,970,000
Hemoglobin—11 grams
White blood cells—5,350

Urine: Albumen — 4 plus. Pus, blood and casts.
Concentration test: 1.012 to 1.017.
N. P. N. 28 mgm. per 100 c.c. blood.
Urea 15 mgm. per 100 c.c. blood.

Course: The patient was placed on the toxemia routine without any improvement. The day after admission the consultant in ophthalmology noted the following: "Widespread large exudate, hemorrhages and edema of the retina. There is a bulbous detachment of the right retina below and left retina nasally. Suggest immediate emptying of uterus." Preparation for cesarean section was made and pentothal sodium selected for the anesthetic. A cesarean section and myomectomy was performed, using 17 grains of pentothal sodium and continuous oxygen. During operation the blood pressure varied from 230/140 to 160/120, pulse from 90 to 120, and respirations between 20 and 30 per minute. The anesthesia time was ninety minutes and the total operating time eighty-eight minutes. The baby was stillborn. The patient was discharged one month later with full recovery of sight.

The series followed was somewhat akin to this case and while very satisfactory, there were two factors of importance, the respiratory depressant effects on the mother and on the baby. In one case a small amount had been given when respirations ceased, but returned by quick use of coramine intravenously, and artificial respiration. The babies in the entire series required serious effort at respiratory stimulation, except in the above case, where we feel the loss of the baby was due to the anesthetic.

We have at our command a sufficient array of anesthetic agents to meet any requirement for general anesthesia and analgesia. They are each not without their faults, but this can be eliminated to some extent by trying to select the anesthetic to fit the case and not the case to the anesthetic. The inhalation anesthetics are all explosive with the proper amount of oxygen added, and this hazard must not be overlooked at any time.

To secure maximum analgesia, the gases should be given with the onset of the uterine contraction and not with the pain. The contraction begins several seconds prior to the sensation of pain. Adequate dosage should be given to control the vomiting reflex, which in a lightly carried patient will evidence itself almost simultaneously with the peak of the pain.

Blood pressure readings should be taken frequently so that an unexpected fall in pressure will not precipitate some degree of shock. Toxic patients with a high blood pressure generally have a temporary marked drop in pressure with delivery of the baby, which quickly rises again.

Acidosis must be kept in mind constantly. The patient who has been in labor for a long period of time is generally acidotic to some degree. The anesthetic can contribute to this acidosis with fatal results.

REFRIGERATION ANESTHESIA IN AMPUTATIONS OF THE LOWER EXTREMITIES

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Read at the meeting of the Michigan Association of Nurse Anesthetists, Detroit, November 13, 1943.

The value of reduced temperature in dealing with a number of pathologic states is being tardily recognized by the medical profession. For example, it has been customary to apply external heat to the cold extremities of the individual with so-called "surgical shock," thus opposing the defense reaction of the body which has caused vasoconstriction in these parts in order that all available blood volume may be saved for the vital centers. The foot of a person with advanced arteriosclerosis may feel cold to the touch; there is no better way of precipitating gangrene than to apply hot soaks or a heat lamp, with the result that the metabolism of the tissues and the oxygen needs are increased beyond the capacity of the diseased arteries.

The principle of reducing metabolic activity of tissue to practically a zero level by refrigeration has been applied with great success to the amputation of the lower extremity. After preliminary animal experiments, Allen, Crossman and their co-workers[1] at the New York City Hospital began to use the method in their poor risk cases. Many of these patients were debilitated old men, with neglected diabetes and infection superimposed on the gangrenous and ulcerated areas on their feet. The mortality in this group is usually very high, but with this method of management, four-fifths recovered.

In a recent article[2], Mock and Mock of Chicago collected 101 cases which had been reported in the literature, most of which were from the original New York group. They added seventeen cases of their own, eight of which were amputations for peripheral vascular disease and nine for trauma. Since April, 1943, the method has been used on six selected cases at the Henry Ford Hospital, and from this limited personal experience, the author believes that it is a valuable anesthesia procedure.

It should be distinctly understood that the tissues are "refrigerated" and not frozen. Freezing produces frost-bite and death of cells; in many ways the end-result of the trauma of freezing is similar to that of burning. Refrigeration is calculated to carry the temperature of the part down to from 0.5 to 5 degrees centigrade. This is above the freezing point of water, and still more above the freezing point of the body fluids with their salt content. The temperature is low enough to stop the conduction of nervous impulses, however, as well as other functions.

The technique has been described well by the New York group, and until the present time it has not been improved on. About three hours' time is needed to prepare the patient for operation. If it is proposed to operate at 11:00 A.M., at 8:00 A.M. three or four ice bags are placed around the upper thigh region, and left in place for a half hour or more. This will numb the skin so that the application of the tourniquet will be bearable. It has been my practice to give one-quarter of a grain of morphine at the same time. Since no general anesthesia is contemplated, the preoperative orders do not include the omission of the patient's breakfast or his usual insulin dose.

At 8:30 A.M., the tourniquet is applied. This is an important step, and no detail must be overlooked. It is essential that this tourniquet obliterate completely the arterial flow to the leg. Heavy black rubber tubing is passed twice around the thigh, one layer being superimposed on the other. Tension on the tubing may be maintained by the use of clamps or passing one end under the other in such a manner that it is fixed securely. Many hospitals have a person who is noted for being able to put on a good amputation tourniquet, and the services of this person should be obtained for this purpose if possible.

The leg is then placed over a large rubber sheet, and cracked ice is packed around the entire extremity, extending a short distance above the tourniquet. About three buckets of ice will be needed. If the head of the bed is elevated so that there is dependent drainage toward the foot, a vessel can be placed to catch the water which drains off the melting ice. During the next two and a half hours, more ice may be added if necessary. The patient is then taken to the operating room with the ice pack in place. When it is certain that the team and instruments are ready, the ice is removed and the site of amputation is dried and painted with the usual skin antiseptic. The tourniquet is left in place until the major vessels have been tied, after which it is loosened and the remaining bleeding points are dealt with. Since most amputations take less than half an hour, I have not felt that it is necessary to carry out such refinements in technique as using chilled saline on the sponges and having the instruments "iced." Needless to say, no warm saline is employed during the operation. After the dressing is in place, I have placed three ice bags on the stump, one to be removed at the end of each three-hour period. Others[2] have recommended that this step be omitted, since there may be some delay in wound healing as a result of it.

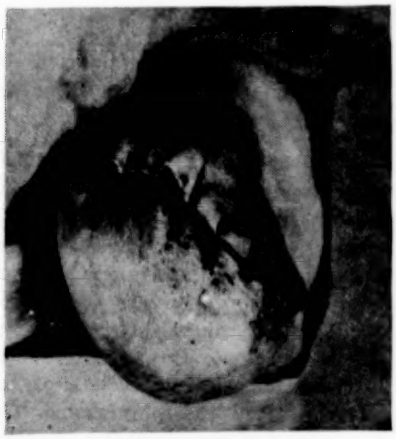

Fig. I

Appearance of stump of thigh on day following Callendar supracondylar amputation under refrigeration anesthesia. Note that there is good nutrition of skin edges, but poor agglutination along suture line. Final healing was slightly delayed.

One of the most striking things about the procedure is the appearance of the anesthetist's chart at the end of the operation. Usually, the pulse and blood pressure are indicated by straight lines across the page. There is no mention of mucus, cyanosis, vomiting, struggling, shock or any of the other items which are sometimes checked with inhalation and spinal anesthesia. Physiologically, the operation is being carried out on an object not attached to the patient. This is the effect produced by the tight tourniquet and the reduced temperature.

Refrigeration anesthesia was thought to be indicated and was used with gratifying results on the following cases.

(1) A man of sixty with advanced arteriosclerosis involving the lower extremities and the cerebral arteries, was suffering from gangrene of the right great toe of six weeks' duration. He had sat up in a chair for three weeks, with little or no sleep. From the minute the tourniquet was applied before amputation he had no further pain.

(2) The leg was removed from an aged negro man with gangrene of the foot and infection with septicemia.

(3) A young man had both thighs run over by a train. It was obvious that both lower extremities would have to be amputated, but by packing them in ice for a few days, the shock could be treated and the surgery performed at the optimum time.

(4) The leg was removed from a woman of seventy years, with severe diabetes and infection of the foot.

(5) An old man suffered arterial occlusion to the left leg as a result of a street car accident. He was in shock for several days, and was found to have extensive bilateral pulmonary tuberculosis. The leg was kept cool for three weeks, and was amputated under refrigeration anesthesia without mishap.

(6) Another man with trauma to the femoral artery and gangrene of the leg had a nearly fatal pulmonary embolus. The femoral vein was ligated immediately, and a few days later, the amputation was completed under refrigeration.

It is felt that the management of these and similar cases is greatly facilitated by the use of the new anesthetic method.

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THE CHOICE OF ANESTHESIA IN GYNECOLOGICAL SURGERY

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The greatest and most important advances in anesthesia have not been in the discovery of new agents, but in the improvement of existing techniques of administration, the perfecting of newer techniques and the combination of various anesthetic methods to achieve a desired result.

In our consideration of anesthesia for the gynecological patient the various types of operations must be considered together with the various types of anesthesia. For operations in the pelvis as elsewhere in the body, no one type of anesthesia should be used routinely. In each case the agent and the method should be selected which are best adapted to the particular conditions. The giving of an anesthetic should never be considered lightly or as a trivial matter. Before passing on to the various gynecologic operations and the agents to be employed in anesthesia for them, we should evaluate the patient for anesthetic risk and also consider the preanesthetic preparation.

(1) The examination of the patient should be made as a routine, prior to operation. The examination should include

  (a) Careful observation of the patient's general condition.

  (b) History regarding duration of illness and any previous history of anesthesias or allergic phenomena to drugs.

  (c) Auscultation of heart and lungs.

  (d) Careful examination of the chart for various laboratory findings, Roentgen ray findings and blood pressure.

This preoperative examination determines the classification of the degree of surgical risk.

(2) Premedication is a most important adjunct of efficient anesthesia. Too often it is inadequately used or neglected entirely. Pre- and postoperative medication should be routine procedures in all major operations and to a lesser degree in minor operations as well, regardless of the type of anesthesia employed. The order for preanesthetic medication on call to the operating room is useless. Preanesthetic medication without a doubt is the most neglected part of the preoperative preparation of the patient, and is an important part from the standpoint of the patient, the surgeon, and the anesthetist. The drugs used, together with the dosage, are determined by the age, sex, complexion, weight and physical condition of the patient. Premedication has a twofold effect, (a) physical and (b) psychic.

(a) Preanesthetic medication decreases the general body metabolism or lowers the demand of the body tissues for oxygen and raises the threshold of irritability for both carbon dioxide and oxygen want. The margin of safe anesthesia is thus increased or widened. The desired level of narcosis is more quickly and easily obtained with the minimum of disturbance or reaction of the muscular, respiratory and circulatory systems. The reduced metabolism results in a slower heart rate with less fluctuation of the blood pressure, and decrease of muscular activity generally throughout the body. A slower pulse means less cardiac labor, less exhaustion and therefore less depression. Reactions to variations of the oxygen content of the anesthetic mixture are less marked or more sluggish, especially during the induction, and a relatively higher percentage of oxygen in the mixture may be maintained throughout the narcosis. Muscular relaxation is more readily obtained. The amplitude of the respirations is lessened, resulting in a decreased excursion of the diaphragm, a factor of importance in both abdominal and pelvic surgery. Another important factor is the inhibition of mucus formation and the decreased tendency to postoperative nausea and vomiting. Adequate premedication protects the patient from the depressing influences of prolonged or deep anesthesia and surgical shock.

(b) The psychic effect of premedication is to lessen or abolish the patient's fears and apprehensions and safeguard her from the recognized entity known as "psychic shock." A patient properly prepared comes to the operating room quiet, sleepy and quite indifferent to her surroundings, mentally and physically at rest. Induction and maintenance of anesthesia follows with the minimum of effort.

The routine premedication of the gynecological service at the Allegheny General Hospital is usually as follows:

(a) A moderately strong laxative the morning preceding the operative day (milk of magnesia 2 fluid ounces or a saline). This is followed by two simple enemas, at 4 and 7 P.M. that evening; a liquid evening meal; one of the barbiturates at 10 P.M., as nembutal or seconal.

(b) Morphine grain 1/6 to 1/8 and atropine grain 1/150 to 1/200 one hour before operation.

Insufficient premedication will cause a persistently rapid respiratory rate. Deeper or lighter narcosis will often correct this but if this is not effective an additional hypodermic or morphine may be given.

Over-premedication also can be a very disturbing factor. The symptoms are a slow respiratory rate with shallow respirations. This condition interferes with the proper absorption or exchange of gases in the lungs and prolongs the time necessary to attain the desired level of anesthesia. Adequate rebreathing will usually correct this condition or a few breaths of 5 to 10 per cent carbon dioxide may be added at intervals to the anesthetic mixture.

Postoperative sedation is equally as important as preoperative medication, but time will not permit us to dwell upon this subject.

The types of anesthesia employed are:

I. Inhalation
II. Spinal
III. Intravenous
IV. Local

I. Inhalation anesthesia

1. *Nitrous oxide-oxygen* fulfills more nearly the requirements

of the ideal anesthetic than any other general or inhalation agent in use at the present time. It has stood the test of the years and increased in use because it possesses so many of the qualities essential for ideal anesthesia. Its advantages are rapid absorption, ease of induction, rapid elimination and recovery. It may be employed for any operative procedure because of its freedom from toxicity and it is especially indicated for patients who are subnormal risks. A patient too sick to tolerate nitrous oxide-oxygen anesthesia is too sick for any other general anesthetic. The chief disadvantages are the cyanosis and the difficulty of securing muscular relaxation in abdominal sections. Its chief use to the gynecologist is in all types of vaginal operations such as D & C, cautery of the cervix, vaginal repair and the other plastic or minor operations.

2. *Nitrous oxide-oxygen-ether* is used in abdominal operations to obtain an increased degree of muscular relaxation. It is still by far the anesthetic of choice in the gynecological department of the Allegheny General Hospital. Ether may be added soon after the induction of anesthesia or at any time during the operation. In the former case it should be added gradually to the mixture of gases as soon as the patient becomes unconscious. The concentration of the ether vapor should be increased only as rapidly as the patient will tolerate it and its administration discontinued as soon as its purpose has been achieved. Rebreathing increases the concentration of the ether vapor as only small amounts escape with each exhalation. When an excess of ether is added to the gases the signs of ether anesthesia predominate, the gas then becoming merely a vehicle for conveying the ether vapor. Cyanosis is avoided as a considerably higher percentage of oxygen in the mixture will then be possible than when nitrous oxide-oxygen alone is employed. With nitrous oxide-oxygen anesthesia, the level of narcosis may be rapidly altered by varying the oxygen content of the mixture, but in nitrous oxide-oxygen-ether anesthesia this flexibility of control is decreased and the muscular, pupillary and other reactions become more sluggish. This being our choice anesthetic agent it is employed for most abdominal sections, for hysterectomy, both abdominal and vaginal; salpingectomy, for removal of ovarian cysts, the various suspension operations of the uterus, appendectomy, extensive vaginal repairs, especially the Watkins interposition operation, where it necessitates opening into the peritoneal cavity, radical vulvectomy, vesicovaginal and rectovaginal fistula.

3. *Ethylene* occupies a position about midway between nitrous oxide and ether, but because of its explosibility in the presence of the cautery it is not very often used in our department.

4. *Cyclopropane* — The mode of action and the signs of anesthesia are in direct contrast to that of nitrous oxide, i. e., in nitrous oxide anesthesia a rel-

atively small percentage of oxygen is administered in order to maintain narcosis, but in cyclopropane anesthesia the percentage of cyclopropane is relatively small compared to oxygen and as a result cyanosis should never be present when it is used. It has an explosive hazard comparable to ethylene, and likewise it is not used extensively.

II. *Spinal Anesthesia*—This may be employed for any operation below the diaphragm. It is indicated in the presence of pulmonary diseases such as bronchitis, bronchiectasis, emphysema, active tuberculosis and asthma. It is also frequently used in the diabetic patient. It should not be used in patients with hypertension or hypotension or ruptured tubal pregnancy, or with any severe hemorrhage. We use it only in selected cases.

III. *Intravenous anesthesia*—The intravenous method of administering an anesthetic agent has a strong appeal to the experienced anesthetist. When skillfully used the method has advantages which make it the method of choice in many instances. With the introduction of evipal soluble and pentothal sodium as intravenous agents, it has been definitely established on a basis that seems firm enough that continued use of the method is not only certain but that it will find a much wider use in the future. Pentothal sodium is definitely more potent than is evipal soluble and for that reason is more satisfactory and is the one agent used almost exclusively today for intravenous anesthesia. With it, induction of anesthesia is quick, maintenance of anesthesia is transient and recovery is rapid. We have found it a very satisfactory agent in most vaginal operations, including extensive repairs. We have not used it very often in abdominal sections. It has proved very satisfactory in spinal anesthesia when the patient is apprehensive and does not want to be awake. There are definite contraindications to the use of the drug. In general, it should not be administered to a patient suffering from dyspnea attributable to respiratory changes or in cases in which dyspnea may develop during or after operation. This is especially true if there is any reason to think that the respiratory passage is or may become obstructed. It is highly probable that in the future other intravenous agents may be developed which may be better. As yet it is undesirable for the inexperienced person to use intravenous agents, for it is true as of other agents that the results obtained depend largely on the skill and caution with which the agent is administered and on a good understanding of its applicability.

IV. *Local anesthesia* in gynecology is confined chiefly to local infiltration, recommended by Gellhorn and other leading gynecologists for more than ten years. Emmett states that local infiltration is the anesthesia of choice for all vaginal operations. He reports a series of 600 cases of vaginal hysterectomy performed with local infiltration of 1/4 per cent novocain.

There are no real contraindications to local anesthesia but there are certain limitations. Extremely nervous patients subjected to the extreme lithotomy position are not very suitable for local anesthesia unless some form of seminarcosis is employed. Special indications for local anesthesia are diseases which constitute contraindications to inhalation narcosis, such as diseases of the lungs and of the circulatory system.

ANESTHESIA FOR CRIPPLED CHILDREN

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Work with crippled children is appealing because they are so anxious to be cured, and are eager to help and encourage one another. They are interesting and cheerful individuals who live in a world all their own, and they are always appreciative of everything that is done for them.

Because the very nature of orthopedic surgery requires more extensive preoperative preparation than some other types of surgery, the operative field is shaved, cleansed thoroughly, and alcohol dressings applied, at least twenty-four hours preceding the operation. Our routine includes forcing of fluids and administration of citrocarbonate until 8:00 P.M. the evening before the operation is scheduled, at which time an enema is given and fluids are limited until four hours before operation, when they are discontinued altogether. An hour before coming to the operating room, a hypnotic is given, the dose governed by the age and size of the child. Those under six receive atropine grain 1/300 to 1/400; children between six and ten receive codeine grain 1/2 and atropine grain 1/300. Older children are given a small amount of morphine and scopolamine, the average dose being morphine grain 1/10 and scopolamine grain 1/400.

Children over six years old respond very well to cyclopropane and oxygen, and since this anesthetic excites less reaction, we feel that it is preferable to drop ether because of the more rapid and pleasant recovery. Very small children do not tolerate prolonged anesthesia because it is difficult for them to breathe against even a slight pressure in the breathing bag. For this reason, drop ether is administered following induction with cyclopropane and oxygen, although in operations of short duration cyclopropane and oxygen alone may be used.

It is necessary in many orthopedic operations to use electrical equipment such as saws, drills and the x-ray machine. Rigid precautions must be used to guard against explosion, and by following such a course we have never had cause for alarm. One precaution used in all cases when there is electrical equipment in the room is a wet, not damp, but *wet* towel wrapped securely around the mask. Our operating room is equipped with twistlock plugs, and the electrical equipment must be attached and tested before the gas machine is turned on. The rubber equipment on the gas machine is always well moistened before it is used, and the machine is placed so that it will not have to be moved during or soon after the operation. No woolen blankets are permitted in the operating room, and no silk or rayon uniforms are worn by the nurses or the anesthetists. The felt pad on the anesthetist's stool is removed, and rubber soled shoes are found inadvisable.

Position is an important factor in orthopedic surgery, as many operations require the patient to be turned several times before completion. If the child is old enough to cooperate, we try to place him in proper position before the anesthetic is begun, making sure that there is no pressure that could cause a posture paralysis involvement. For operations on the back, such as spine stabilization and fascia transplantation, where the patient must be in a prone position, a pair of shoulder rests is used, and a folded cotton blanket is placed well under the pelvis to facilitate breathing. Sand bags play an important part in maintaining proper position and should be correctly placed to insure a comfortable position for the patient before the anesthetic is started.

In addition to becoming acquainted with the child in his room, it is well to be the first to greet him when he comes to surgery. After the child is placed on the operating table, the rubber bag is described as a balloon that he must try to blow up, explaining step by step the sensation of tingling, numbness and buzzing in his head, and suggesting that some say it is just like taking an airplane ride. Usually he is told to remember his dreams, as he will be asked about them later.

The breathing bag is nearly filled with oxygen, and the mask adjusted to the face. Then 500 cc. of cyclopropane and 700 cc. of oxygen are added during the induction period. When it is necessary to add more cyclopropane, 300 cc. of cyclopropane and 500 cc. of oxygen are added. This may seem a small quantity but for this type of surgery the patients do not need to be carried deeply. Care must be used not to have too great tension on the breathing bag because it is difficult for children to breathe against pressure. At the close of the operation, the anesthesia must be maintained until the fixation is applied. This may be a cast, traction or some other type of restraint. The breathing bag is then emptied almost completely and filled with 50 per cent oxygen and 50 per cent helium, and the filter turned off in order to stimulate respiration, so that the patient leaves the operating room almost awake.

Upon being returned to his room, a routine intravenous injection of 5 per cent glucose in normal saline is given, the amount being governed by the age and size of the child, 250 to 500 cc. being the usual quantity. This is to prevent any tendency toward nausea or vomiting, and it also speeds recovery from the effects of the anesthesia.

It is often necessary for children to undergo surgery several times. While it is an easy matter to anesthetize a child and after the operation merely return him to his bed, to do so in such a way that he will look forward to his next operation rather than dread his return to the operating room is another matter. It would be most unpleasant to have these children dislike seeing you when you entered the ward. It is a pleasure to visit them when you are greeted with a smile, and they are anxious to tell you that they will be down to see you in the operating room again. Their hopeful outlook on the future is enough to inspire anyone to greater effort.

METRAZOL (PENTAMETHYLENTETRAZOL), N.N.R. IN ANESTHESIA

A Review

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Over the past one hundred and fifty years there has been a definite trend toward specific medication, i. e., drugs that are specific in certain diseases, and if not specific in this sense, toward preparation of drugs that have a specific action. Metrazol (pentamethylentetrazol), a synthetic, organic chemical substance, is a drug with a specific action on the central nervous system. Perhaps this action can best be summarized by referring to what Goodman and Gilman[1] have to say concerning it:

.....“Metrazol is a central nervous system stimulant. Its action is primarily on the higher centers but all parts of the cerebrospinal axis are stimulated to some degree. When given in high dosage to experimental animals, metrazol first causes marked restlessness which is followed by excitement, increased motor activity and typical epileptiform convulsions. The convulsions can still be elicited after removal of the cerebrum above the thalamus. With successive ablation of lower segments of the brain stem, the convulsive dose of metrazol becomes greater.

“The medulla also shares in the stimulation. Respiration is markedly increased by large doses of metrazol. The vasomotor and vagal centers of the medulla are likewise stimulated.

“The reflex activity of the cord is increased. In fact, when large amounts of metrazol are administered, the epileptiform convulsions may terminate in typical tonic convulsions. The action of metrazol on the spinal cord is especially evident if the reflex activity of the cord has been lowered by central nervous system depressants. In such a case, a relatively small dose of metrazol will restore spinal reflexes toward normal. There appears to be a definite limit in the ability of metrazol to restore to normal the functions of the depressed spinal cord. Koll noted that once the maximal action of the drug was obtained, it could not be enhanced by the injection of additional amounts. However, if strychnine were now injected, a further increase in reflex activity was obtained. Likewise, Koll observed that metrazol was capable of increasing reflex excitability after strychnine had been allowed to exert its maximal effect.

“The analeptic action of metrazol on the higher centers of the central nervous system is evident from its ability to counteract the depression produced by hypnotic drugs. This is prominent when directed against the depression caused by barbiturates, avertin, paraldehyde and chloral hydrate. So marked is the antagonism of metrazol to avertin that experiments have been described in which animals with complete motor paralysis have been restored to normal immediately after the administration of metrazol. Not only is motor activity restored, but failing respiration and circulation are stimulated through the medullary action of the drug. The effect of metrazol on the medulla is much more prominent when this region is depressed than when it is functioning normally. The action is probably a direct one for typical effects on blood pressure and respiration can be obtained after the carotid sinus and carotid body have been completely denervated. As a result of this analeptic action, metrazol can protect against toxic doses of central depressants. Likewise, individuals depressed by hynotics (e.g., amytal) are more resistant to the actions of metrazol." . . . . .

From the preceding description, it can be seen that the action of metrazol is exerted on the higher centers in the cortex and also on the respiratory and vasomotor centers in the medulla. These are the identical regions of the central nervous system that are depressed by hypnotic and analgesic drugs given for premedication in anesthesia, as well as substances given by inhalation, by rectum or by injection for anesthesia. The action of metrazol on the respiration and circulation is easily demonstrated in animal experiments. When animals are under the influence of a barbiturate with lowered blood pressure and decreased respirations, the injection of metrazol quickly helps restore the blood pressure toward the normal level and increases the depth of respiration.

Because of such fundamental actions, metrazol is used (a) to help prepare weakened patients for operation: (b) to help overcome untoward reactions to the anesthetic or premedication that develop during the operation itself; and (c) for denarcotization following the operation to help guard against postoperative pulmonary complications. The use of metrazol rounds out the procedures that are frequently employed for resuscitation—withdrawal of the anesthetic, inhalation of carbon dioxide and oxygen mixtures, and manual resuscitation. Metrazol occupies this important position by virtue of its action of sensitizing the respiratory center to carbon dioxide, making it more responsive when mixtures of carbon dioxide and oxygen are given; in other words, by using metrazol there is a greater chance of resuscitating a depressed patient than there is by use of these other procedures alone. In certain instances it is not necessary to use carbon dioxide-oxygen mixtures but it is desirable only to increase the gaseous interchange. This can be accomplished by the administration of metrazol alone, which, by virtue of its action on the respiratory center, deepens respiration and increases pulmonary ventilation.

For the moment, let us compare the action of metrazol with other substances that are used in resuscitative procedures:

Epinephrine:—This is a sympathetic stimulant, a vasoconstrictor, the administration of which is rapidly followed by a rise of the blood pressure to greatly above normal, this being followed within a few seconds by a sudden, sharp fall in the blood pressure, in many instances below the normal level. It might be pointed out that while epinephrine does cause dilation of the coronary arteries, the sudden rise in blood pressure is so great that often this coronary dilatation cannot compensate for the strain that epinephrine may throw upon a weakened heart. The same may be said of *ephedrine* to a certain degree. In the case of this latter drug, the blood pressure is maintained at a level considerably above normal for a period of several minutes.

Drugs Related to Nicotine:—With drugs in this class there is a primary stimulation of respiration, and not so much action on the circulation, and this is followed by a secondary depression with prolongation of recovery time[2], [3].

Picrotoxin:—This preparation has been suggested as a stimulant[4]. Its action is not manifested quickly as is the case with metrazol, but there is a long latent period, possibly twelve to fifteen minutes, between the time of the injection and the time the action of the drug is apparent. It has been advised that picrotoxin never be given unless an injectable barbiturate is at hand to overcome convulsions should they develop[5].

Caffeine:—This drug seems to have some direct cardiac action but it is mostly a cortical stimulant. Its effect on the respiration is largely reflex, however.

It would seem from an analysis of the actions of these drugs then, that metrazol is preferable to picrotoxin because it has an early peak action and is not likely to cause convulsions; to caffeine because of its direct respiratory stimulating action; to substances related to nicotine, such as nikethamide and lobeline, because it is not followed by secondary depression; and to epinephrine and ephedrine-like substances because there is no sudden rise of blood pressure greatly above normal, throwing a strain on a circulatory mechanism that may be already weakened.

Some years ago, Barlow, working under a grant from the Council on Pharmacy and Chemistry of the American Medical Association, compared several analeptics and analeptic substances, including metrazol, nikethamide, picrotoxin, and carbon dioxide-oxygen inhalation, as to their efficiency in overcoming depression caused by sub-lethal and lethal doses of chloral, avertin and nembutal[6]. He concluded that the respiratory effects of metrazol were greater than those of any of the other substances or procedures studied. This report was followed by a clinical study of three analeptics, metrazol, picrotoxin and nikethamide, by Burstein and Rovenstine of Bellevue Hospital[7]. They compared these analeptics in various types of anesthesia and drug depression, and found in the main that the results obtained with metrazol were more satisfactory than with the other analeptics...... "The cerebral stimulation frequently seems more pronounced than with other analeptics" ... and "the respiratory response to the former (metrazol) is immediately more pronounced" than with picrotoxin. Nikethamide was observed to be less effective and seemed to prolong depression in some instances.

Types of anesthesia with which metrazol may be used

In the literature, reference is made to the use of metrazol in conjunction with various types of anesthesia — inhalation, rectal, spinal and injection.

Inhalation Anesthesia: — Strasser[8] was the first to report on the use of metrazol in conjunction with *nitrous oxide* and *ether*. He employed a McKesson gas-oxygen machine or gave ether by the slow-drop method. In some of the cases he reported the pulse rose during the operation and became very weak, and the respirations irregular. By giving 1 cc. of metrazol the pulse became more normal and respirations deepened, allowing the operation to be completed without further difficulty. At times he found it necessary to give a second injection of metrazol.

One of the most convincing reports having a bearing on the use of metrazol in inhalation anesthesia is that by Whitehead and Draper [9]. These observers studied various analeptics, particularly metrazol and nikethamide, in animals to determine (a) the effect of the analeptic in preventing onset of respiratory arrest and (b) the effectiveness of the analeptic in overcoming respiratory arrest induced by *ether, chloroform* or *divinyl ether.* Their figures show that the amount of anesthetic required to produce respiratory arrest was considerably increased when metrazol was given beforehand and that there was greater likelihood of resuscitation with metrazol than with the other analeptics. They had no failures to resuscitate animals when metrazol was administered in addition to artificial respiration and oxygen. These authors also stressed the fact that the circulation, as well as the respiration, should be stimulated and that the most efficient artificial respiration cannot save a patient whose circulation lacks the necessary vigor. It is an advantage if the analeptic acts on the circulation to speed the rate of transport of gases between the lungs and the tissues—such a drug is a very useful aid to resuscitation. There is experimental support for the view that metrazol may aid resuscitation from *chloroform* overdosage through a stimulant action upon the circulation which tends to lengthen the resuscitation interval and increase the rate of gas transport between the lungs and tissues[9].

Burstein and Rovenstine[7] pointed out that frequently after *cyclopropane* anesthesia patients were observed who had abnormally slow respiration and pulse rate, and low blood pressure. Metrazol was given and was more effective than other analeptics in overcoming this condition.

Rectal Anesthesia:—In 1936, Karl Schlaepfer[10], of Milwaukee, reported on the use of metrazol in conjunction with *avertin* anesthesia. In some of his cases there was cessation of respiration at the onset of the operation and in others it developed later in the course of the operation. Metrazol was effective in restoring normal rate and depth of respiration. He found also that by giving 1 or 2 cc. of metrazol postoperatively he could shorten the period of postoperative hypnosis to about one-fourth of the time usually noted.

Evipal came into use as a rectal anesthetic a year or so later and it was felt desirable to denarcotize patients at the close of the operation. Hogan[11], by giving 3 cc. metrazol intravenously and 3 cc. intramuscularly while the patient was still on the table, found that he could raise the patient to the second stage of anesthesia and let him sleep through the pain zone with the anesthetic acting as a postoperative analgesic. In cases where patients were dangerously depressed, the entire dose of 6 cc. was injected intravenously as the initial dose, and improvement was maintained by the use of 1 or 2 cc. metrazol subcutaneously at half-hour to hour intervals. Hogan expressed the opinion that by using metrazol for denarcotization, aeration of the terminal alveoli was accomplished more safely than could be done with mechanical hyperventilation, in which there may be some danger of rupturing the alveoli, and that the danger of postoperative pulmonary atelectasis was guarded against.

Spinal Anesthesia:—Every once in a while, the question as to the value of metrazol in spinal anesthesia arises. It has not received extensive use here, perhaps because the sympathomimetic drugs, such as ephedrine and neosynephrine, are quite efficient in maintaining the blood pressure throughout the course of spinal anesthesia. On the other hand, the work of Cranston and Bieter[12] indicates that metrazol is of some value as a synergist to neosynephrine and pitressin in this connection. Although Schlaepfer[13] did not often observe any respiratory embarrassment in a series of cases operated on under *nupercain* spinal anesthesia, he advised the use of analeptics such as metrazol for combating respiratory difficulties.

Injection Anesthesia:—During the past few years, the convenience and effectiveness of intravenous anesthesia has led to its adoption quite generally by civilian physicians as well as those in the armed forces of the United States. *Evipal* and *nembutal* — two short-acting barbiturates — were the first to be given in any large series of cases, but *pentothal sodium* is the popular intravenous anesthetic today. While the action of pentothal sodium is so short that undue depression of the central nervous system does not occur often, this complication does present itself in a sufficient number of cases to warrant noting it. Reynolds[14] pointed out that there were two stages to depression with pentothal sodium, namely, the stage of respiratory depression, which is followed by the stage of circulatory depression. During the second stage there is little that can be done for the patient, but during the stage of undue respiratory depression, analeptics, particularly metrazol, are an aid to resuscitation. Fulton[15] has also observed that pentothal sodium is a respiratory depressant and that overdosage, accompanied by respiratory depression, may occur. He advises an adequate airway (by endotracheal intubation if necessary), artificial resuscitation with 5 per cent carbon dioxide and 95 per cent oxygen, and intravenous use of respiratory stimulants, such as metrazol. Davison and Rudder[16] said ..... "Shock is occasionally encountered in prolonged operations where it is necessary to give large doses (of pentothal sodium). Glucose 5 per cent intravenously and metrazol 1 or 2 cc. intravenously will usually suffice." .....

Piekenbrock and Olson[17] used metrazol for denarcotization following pentothal sodium anesthesia— ...... "Following the termination of the anesthetic, it has been our custom to inject 3 cc. of metrazol intravenously. We have found metrazol to be a most efficient denarcotizing agent, and by its use the anesthetic state will be terminated promptly and any undesirable depression avoided. The results obtained from the postanesthetic injection of three cubic centimeters of metrazol have been most gratifying." ......

Dosage of metrazol

The factors determining the dosage of metrazol are (a) degree of depression and (b) the age and size of the patient. The former, degree of depression, is the most important factor. It should be emphasized that when a patient is greatly depressed, a large dose of metrazol may be required to overcome the depression. This has already been referred to in the description of Hogan's use of metrazol. For moderate degrees of depression, dosages of metrazol up to 3 cc. may be given by any preferred route — subcutaneously, intramuscularly or intravenously. Some anesthetists have said that they begin metrazol medication with an injection of 5 cc. intravenously and note the reaction of the patient. Usually there is an increase in respiration due to stimulation of the respiratory center. This is accompanied by a rise of a lowered blood pressure toward the normal level, due to the fact that metrazol acts on the vasomotor center, helping to restore vascular tone. It might be helpful to think of giving enough metrazol to "neutralize" the narcotic. From his experiments, Jackson[18] found that once the individual susceptibility is determined, it is possible to forecast with considerable accuracy the amount of metrazol required to overcome the depressing effects of a given amount of narcotic. When the "neutral" point has been passed, there may be muscular twitching, which does not indicate that a convulsant dose of metrazol has been given. If muscular twitching does not occur, additional doses of metrazol, 1 to 3 cc., may be safely given as often as necessary. It is advised that the condition of the patient be watched and when respirations weaken or the blood pressure falls, another dose of metrazol be given.

The matter of dosage cannot be left without reference to the use of metrazol as a convulsant agent. Metrazol has come into considerable use during the past six years for the purpose of inducing convulsions in psychotic patients. In such instances, the situation is altogether different from its use in anesthesia—the psychotic patient is not under the influence of a depressant narcotic or toxic substance and therefore is more sensitive to metrazol than the narcotized patient. As a result, when a dose of 4 to 6 cc. metrazol is injected into the psychotic patient a convulsion may occur, while this same dose injected into a narcotized patient does not cause a convulsion, but, on the other hand, exerts a beneficial denarcotizing action.

Use with other substances

Oxygen:—As mentioned above, metrazol complements other resuscitative procedures used in anesthesia. There is no contraindication to the simultaneous administration of metrazol and oxygen therapy. In fact, there seems to be more likelihood of revivification when the two are used together than when oxygen alone is used. When oxygen is not available, metrazol may be given and artificial respiration induced. Always in cases requiring resuscitation, the first thought should be an adequate airway; possibly the next, oxygen or artificial respiration; and, if adequate help is available, preparation of a syringe with metrazol for injection. Metrazol can be injected repeatedly as long as necessary and, in some instances, has been given as often as every half-hour for over twenty-four hours. The use of metrazol with oxygen has been recommended by Burstein and Rovenstine[19] who stated ….. "Central respiratory stimulants may possibly be used with advantage in conjunction with oxygen treatment and artificial respiration. During depression due to morphine overdosage pentamethylentetrazol (metrazol) is often of value as an analeptic. It may be employed postoperatively when it is observed that, due to the morphine, recovery from anesthesia is unusually prolonged. It may be administered during the course of anesthesia or preoperatively when central nervous depression from preanesthetic medication is evident. Analeptic therapy does not preclude oxygen therapy, with which it should always be combined. This is well illustrated in the last case where the respiratory and cerebral stimulation produced by metrazol did not prevent the development of anoxemic symptoms (generalized tremors, irrationality, apprehension and restlessness) which diminished and disappeared following prolonged oxygen administration." …..

Likewise, there is no contraindication to the use of metrazol at the same time with *glucose* or *saline infusions, blood plasma* or *whole blood transfusions.*

Other conditions

There are a number of other conditions that might be mentioned here that are not directly anesthetic problems, where metrazol is of value:

Acute barbiturate poisoning:—This is a real problem in most general hospitals in large cities. In spite of restrictions on the sale of barbiturates, there has been an increasing number of attempted suicides with these drugs. The antidotal action of metrazol in barbiturate depression was emphasized in the report by Barlow[6] mentioned above. Fantus and Kohn-Richards[5] also pointed out the advisability of using analeptics. They stressed the importance of giving analeptics to the point of effect. Other procedures, including intravenous fluids, are recommended. One of the most important reports on barbiturate poisoning is that by Walker and Teague[20] who stated that metrazol and picrotoxin theoretically seem to be the analeptics of choice. ..... "In choosing between these two drugs, it would seem that metrazol possesses certain advantages over picrotoxin. Chemically, this drug is pentamethylentetrazol. It is a stimulant almost as powerful as picrotoxin, but not quite as prolonged in its action clinically. There is no latent period, and the maximum effect is exerted almost immediately after injection. This practically eliminates the danger of convulsions from overdosage which is present in the use of picrotoxin because of its delayed 'peak' action." ...

Recently, France et al[21] reported on the recovery of a patient who had taken 8 grams of a mixture of pentobarbital sodium and seconal. This patient was treated with several stimulants, including metrazol and picrotoxin. In commenting on the treatment, the authors state that they believe caffeine was of doubtful value "but adequate fluid balance with plasma and repeated sustained injections of picrotoxin and metrazol should receive the most credit for recovery." ..... They pointed out also that the "peak" action of metrazol occurs ahead of that of picrotoxin and they combined picrotoxin with metrazol to obtain a more sustained effect. However, other anesthetists have felt that it is more advisable to give metrazol alone in repeated injections when the effect begins to wear away, because of its greater safety.

Morphine poisoning:—As morphine, dilaudid hydrochloride and other opiates are most often used for premedication, undue depression from these substances is also a problem to the anesthetist. Metrazol is an antidote to morphine as well as to the barbiturates. Burstein and Rovenstine[7] observed that metrazol elicited an immediate response in morphine depression with stimulation of the respirations, which became more regular, the blood pressure and pulse improved and the patient frequently reacted by moving his head and occasionally by awakening. Two or three repeated doses of metrazol were usually found sufficient to relieve severe depression from sublethal doses of morphine.

Acute alcoholism: — Another problem in general hospitals is the treatment of acute alcoholics which the police bring to the Emergency Room. If such cases are not properly disposed of here, valuable hospital room can be taken up by a "bunch of drunks." In an attempt to solve this problem, Orenstein, Bowman and co-workers at Bellevue[22] began to treat all their acute alcoholics with an initial dose of metrazol while they were still in the Receiving Room. By so doing they found it possible to avoid admitting many of these patients to the hospital. This was true with both the "fighting" drunks and those who were "out cold." By administration of 5 cc. metrazol intravenously and repetition of this dose within five minutes if a reaction were not evident, the symptoms of acute alcoholic depression were rapidly overcome. Agitated alcoholics began to quiet down while comatose patients began to awaken. This apparent paradoxical action of metrazol is explained as being due to the effect of metrazol in restoring control to depressed inhibitory centers.

Asphyxia neonatorum:—This is a condition the treatment of which the nurse anesthetist is often concerned with. Very often asphyxia neonatorum is ascribed to the anesthetic or analgesic that the mother receives. Because of the action of metrazol in antidoting the effects of most of these analgesics and anesthetics, it has proved of value in initiating and maintaining respiration in these depressed infants[22]. Another suggestion has been made[23, 24] that 2 or 3 cc. of metrazol be given to the mother just before the baby is delivered, especially when the heart tones are faint, in an attempt to guard against apnea neonatorum. Of course, the action of metrazol is more effective when oxygen is administered to the infant at the same time.

There are other conditions, such as respiratory difficulty as a result of prolonged administration of sulfonamide derivatives, et cetera, where metrazol has proved of value, which might be discussed but they do not have so great a bearing on anesthesia as those we have just covered.

Practical considerations

There are certain practical considerations which are of interest to nurse anesthetists.

Stability of metrazol:—This chemical compound is very stable and is not changed by long exposure to heat, light or other physical agents. This permits sterilization of metrazol solutions by autoclaving or, in the absence of an autoclave, by boiling. Of course, when metrazol solution is boiled it becomes more concentrated.

Dosage forms: — Metrazol 10 per cent solution is available in 1 and 3 cc. ampules and in 30 cc. rubber-capped vials of sterile solution. All these dosage forms are packed in multiple containers for hospitals.

Conclusions

In conclusion, it may be stated that metrazol is of proved value as an antidote to drugs used preoperatively as analgesics, to substances used by inhalation, by rectum, spinally or intravenously for anesthesia, and for undue depression from postoperative analgesics.

There is no contraindication to the use of metrazol in conjunction with other resuscitative measures, such as carbon dioxide-oxygen mixtures, saline or glucose infusions or plasma and whole blood transfusions. In fact, the effect of these other measures may be enhanced when metrazol is given at the same time. Likewise, metrazol is useful in treating depression from these drugs in other instances, such as attempted suicide from the barbiturates, acute alcoholism, morphine or other narcotic drug depression.

The dose depends on the degree of depression — the deeper the depression, the larger the dose of metrazol that is used. Ordinarily 1 to 3 cc. are given as an initial dose, but in urgent cases 5 or 6 cc. may be given with safety. The effects of metrazol are obtained from subcutaneous, as well as intramuscular or intravenous injection. For this reason it becomes a most useful drug for the nurse anesthetist.

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NOTICE

The annual meeting of the Ohio Association of Nurse Anesthetists has been cancelled for 1944. All anesthetists who can possibly do so are urged to attend the convention of the Ohio Hospital Association, which will be held in Columbus March 2-23, 1944.

"QUESTION AND ANSWER" COLUMN

Question 1. What are the advantages of a recovery room?

Answer:

a. Trained personnel are in constant attendance.

b. Equipment, such as airways, catheters, suction, and analeptics, is concentrated in one place.

c. It is near the operating room for bronchoscopy and emergency oxygen.

d. No relatives are present.

e. Nursing shortage is relieved by having one or two nurses care for several postoperative patients, who are awake on return to the division.

f. Its location makes it more convenient for giving parenteral fluids.

Question 2. If a patient were admitted with multiple burns of the body and with first and second degree facial burns, how should these areas be protected while giving an inhalation anesthetic?

Answer:

a. By saline compresses.

b. By sterile vaseline gauze.

c. By gutta percha.

Following the induction period an intratracheal tube may be used, thus eliminating the pressure of a face mask.

Question 3. Should it be routine for an ambulance to carry only a mixture of carbon dioxide and oxyggen?

Answer: A supply of oxygen should be available as well as carbon dioxide and oxygen mixtures.

Question 4. What is the advantage of intratracheal suction?

Answer: When it is done routinely following operation, it prevents many upper respiratory complications.

Question 5. What should be done if the patient aspirates on the table and a bronchoscopist is not available?

Answer: The following measures may be taken by the nurse anesthetist without the aid of a bronchoscopist:

a. A suction catheter may be passed through an artificial pharyngeal airway and the aspirated material recovered.

b. By direct vision laryngoscopy a semi-rigid catheter with a lumen large enough to admit a common duct catheter, may be passed into the trachea and the contents recovered.

c. Blind intubation may be done, using a Magill tube and the aspirated contents removed by passing a common duct catheter through the lumen attached to suction.

ACTIVITIES OF STATE ASSOCIATIONS

FLORIDA

Annual meeting of Florida Association of Nurse Anesthetists was held November 13, 1943, at Seminole Hotel, Jacksonville, and following officers were elected:

President	Alpha E. Schier St. Vincent's Hospital, Jacksonville
Vice-President	Mrs. Evon E. Compton 1227 Greenwood Avenue, Orlando
Secretary-Treasurer	Mrs. Flora M. Burg Jackson Memorial Hospital, Miami
Trustees	Mrs. Mary F. Phillipoff Caroline I. Duffield

MASSACHUSETTS

The Massachusetts anesthetists met October 26, 1943, at the home of Miss Shina Ritchie, 39 Moody Street, Chestnut Hills, with fourteen members and two guests present. Buffet supper was served.

It was voted to have only two meetings a year for the duration, in the spring and fall — the fall meeting to be held with the New England Hospital Association if possible. Mrs. Eva MacArthur gave a report of the national convention held in Buffalo in September.

NEBRASKA

The Nebraska Association held its seventh annual meeting January 4, 1944, at Doctors Hospital, Omaha, with twenty-three members and guests present. Josephine Dorsey, Charlotte Ganzel and Kathryn Svoboda were hostesses.

A feature of the meeting was the reading of another letter from Lt. Ruby Christensen, with a dramatic story of her landing "somewhere in Italy." Interesting letters were also read from Lt. Agnes Dickinson and Lt. Helen Seni.

Mrs. Gulotta gave her annual report and stated that the Association had added new members from additional hospitals; also that the hospital superintendents and surgeons are recommending membership in the organization to their anesthetists.

The purchase of a one hundred dollar War Bond was approved.

Dr. Dorothy H. Thompson, Chief Anesthetist at Mercy Hospital, Council Bluffs, was the guest speaker and gave a talk on "Some of the Newer Trends in Anesthesia," stressing the importance of pentothal sodium. This was followed by a stimulating discussion.

Officers:

President	Mrs. Wilhelmina S. Gulotta 1734 South 17th St., Lincoln
Vice-President	Edith Ackerman St. Joseph Hospital, Omaha
Secretary-Treasurer	Pauline Young (on leave of absence)
Trustees	Agnes G. Hain Mrs. Laura V. Nehring

PENNSYLVANIA

The second "War Conference" of the Pennsylvania Association of Nurse Anesthetists will be held at the Hotel William Penn, Pittsburgh, April 12-13, 1944. For further information write Helen Garvey, St. Francis Hospital, Pittsburgh, Chairman Program Committee, or Mrs. Helen Young Walker, Secretary-Treasurer, 1824 Wallace Street, Philadelphia.

UTAH

Annual meeting was held November 3, 1943, at the Latter Day Saints Hospital, Salt Lake City.

Officers elected:

President
  Mayme C. Garrison
  463 "D" Street, Salt Lake City

Vice-President
  Mrs. Lodema J. Brown
  1168 E. 8th, South, Salt Lake City

Secretary-Treasurer
  Ellenor M. Lee
  23 South 8th, East, Salt Lake City

Historian
  Asenath Bigler
  473 "E" Street, Salt Lake City

Trustees
  Mayme C. Garrison
  Mrs. Lodema J. Brown
  Ellenor M. Lee
  Asenath Bigler
  Mrs. Loretta F. Case
  Vilo Redd
  Annie J. Hall

Mayme C. Garrison, President

Treasurer's report:

Cash on deposit August 31, 1942		$ 30.00
Cash on hand August 31, 1942		.08
Receipts Sept. 1, 1942, to Aug. 31, 1943:		
Dues — American Association	$ 76.00	
State Association	48.00	
Application fee	1.00	
Received for Trust Fund	2.10	
Received for Flower Fund	4.00	
	———	131.10
		$161.18

Disbursements Sept. 1, 1942, to Aug. 31, 1943:

Dues to American Association	$ 76.00	
Plant and card	2.30	
Cashier's check and money order	.54	
Stamps and stationery	1.94	
Trust Fund	2.10	
Defense bonds	37.00	119.88
		$ 41.30

Balance as of August 31, 1943:

Cash on deposit	$ 20.00	
Cash on deposit (convention fund)	10.00	
Cash on hand	7.30	
Cash in Flower Fund	4.00	
Total		$ 41.30

Included in assets are three Defense Bonds costing $18.50 each ($25.00 maturity value), total maturity value $75.00.

The next regular meeting of the Utah Association will be held March 8, 1944. For further information write Miss Ellenor M. Lee, 23 South 8th, East, Salt Lake City.

MINNESOTA

First fall meeting held at Miller Hospital, St. Paul, on October 5, with nineteen members and six visitors present.

The Minnesota Association is planning another course of lectures in anesthesiology to be held at the Center for Continuation Study, University of Minnesota. Details will be announced later.

Treasurer's report:

Cash in bank, June 1, 1943		$ 336.24
Receipts		
Dues — active members	$ 30.00	
— associate members	3.00	33.00
		$ 369.24
Disbursements		
Ballot printing	$ 1.00	
Statements, out of town checks	.30	
Expenses, Minneapolis Hosp. Association...	6.00	
Postage	9.00	
Expenses two delegates to national convention	150.00	
Dues transferred to American Association...	21.75	
Printing of stationery, notices and statements	19.50	207.55
Balance in bank October 1, 1943		$ 161.69

CAMILLA HAUG, Treasurer

A NEBRASKA ANESTHETIST PROVES HER FAITH

WILHELMINA GULOTTA

Lincoln General Hospital, Lincoln, Nebraska

Mrs. Ethel Gilmore Bardin is a Nebraska nurse anesthetist, long an invalid, immobilized by a body cast and arm splints, in Lincoln General Hospital. Unfailingly she greets visitors with a cheerful word and a smile. Fellow nurses who devote themselves to her care soon become her friends, drawn to her by happy qualities in her nature and her words of kindness and appreciation.

After she was graduated from the School of Anesthesia at Barnes Hospital in St. Louis, Mrs. Bardin spent five years in her first position in St. Michael's Hospital, Grand Forks, North Dakota. She admits that then the lure of the Pacific Isles captivated her imagination and that adventure beckoned. So it was with eager expectations she sailed for Hawaii to join the anesthesia staff of Queen's Hospital in Honolulu. She was married while in Hawaii. When invalided by complicated osteomyelitis, she longed for home and America. Since being returned two years ago to Lincoln General Hospital, her Alma Mater, she has been under the constant care of Dr F. L. Rogers and Dr. H. Winnett Orr, Lincoln's own internationally known orthopedic surgeon.

A spirit of good will moved the Nebraska Association members to action as soon as they became aware of the plight of their fellow worker. They helped her to secure an associate membership, speeded by a sympathetic national Membership Committee. They aim now to win new friends for her through the pages of our popular Bulletin and by this appeal to bring more sunshine into her niche-like world. Ethel Bardin will be grateful to hear from anesthetists all over the land who may read her story here. A postcard shower, with pictures of hospitals, nurses' homes and churches, will start a diverting hobby for her and will surely come as a welcome event in the quiet of her slowly convalescing days.

To her fellow patients in the ward she has become an inspiration by her serenity and courage and her firm hope for recovery. She makes them feel that no matter what blessing may be taken away, for a time, it is not wholly lost, because, under a benign Providence, there ever remains a good measure of light, love and happiness for us all in a world composed of friends.

In Memoriam

Miss Anne Beausoleil, who had been a member of the Association since 1938, died October 15, 1943, at Permanente Foundation Hospital, Oakland, California, where she had been employed.

Miss Adella I. Schultz died September 1, 1943, at Berkeley General Hospital, Berkeley, California. Miss Schultz had been a member of the California and American Association of Nurse Anesthetists since 1933.

Sister Clara Behnke, head anesthetist at Evangelical Deaconess Hospital, Detroit, for a quarter of a century, died January 9, 1944, at the age of sixty-four. Sister Behnke was a native of Bromberg, Poland, and came to America in 1912. She had been a member of the Michigan and American Association of Nurse Anesthetists since 1938.

Present Officers:

President	Mrs. Rosalie C. McDonald Emory University Hospital Emory University, Georgia
Vice-President	Helen Blanchard 1342 — 15th Street, Troy, New York
Treasurer	Gertrude L. Fife University Hospitals of Cleveland Cleveland 6, Ohio
Trustees	Agatha C. Hodgins, Massachusetts Rosalie C. McDonald, Chairman, Georgia Helen Blanchard, New York Rose G. Donovan, Pennsylvania Gertrude L. Fife, Ohio Edith H. Holmes, Illinois Helen Lamb, Missouri Margaret F. Sullivan, New York

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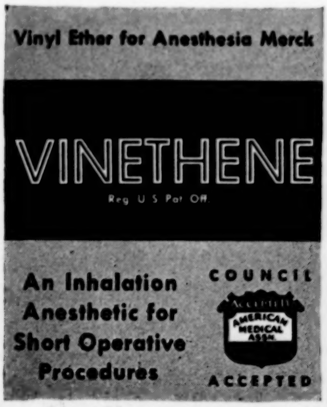

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